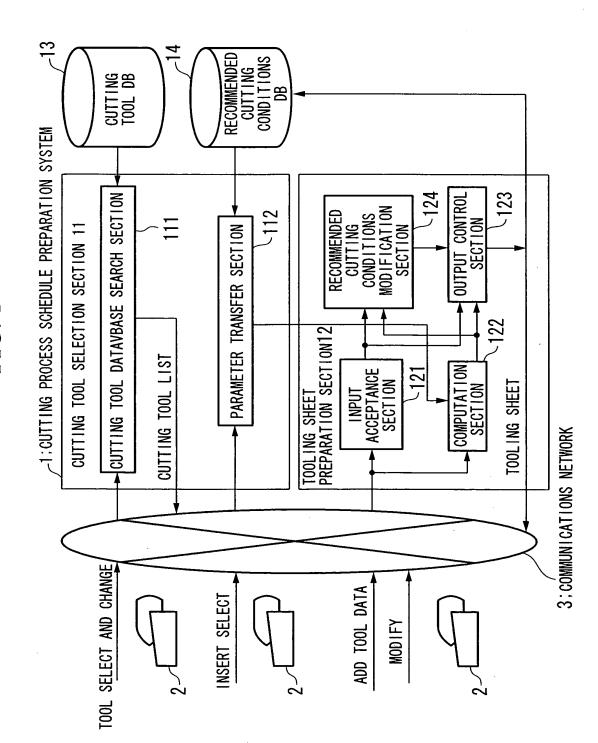


. ,

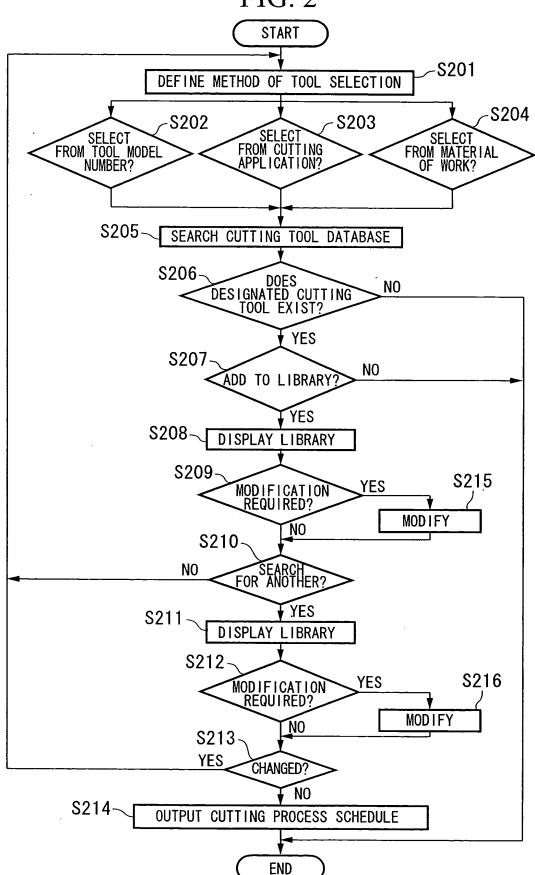
OBLON, SPIVAK, et al Docket No: 247925US2 Inventor: Masato YAMADA, et al. Serial No: 10/760,459 Reply to NFMP dated: April 28, 2004 Replacement Sheet

FIG. 1





. ,





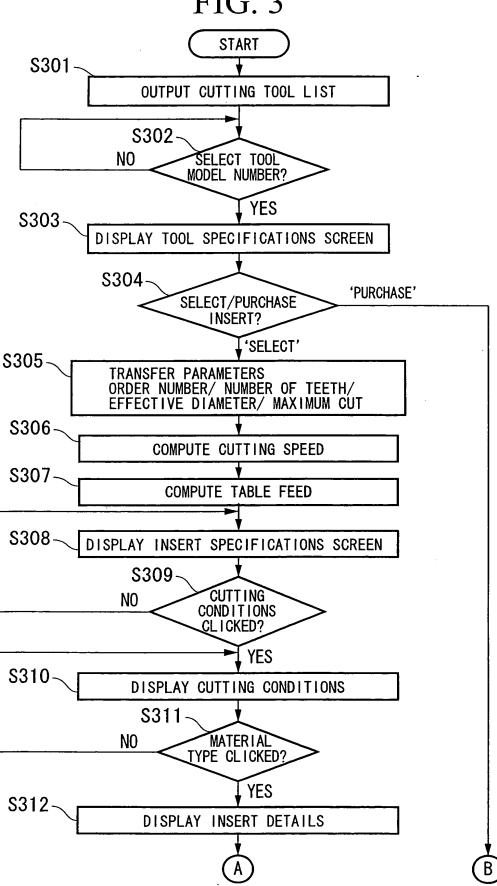


FIG. 4

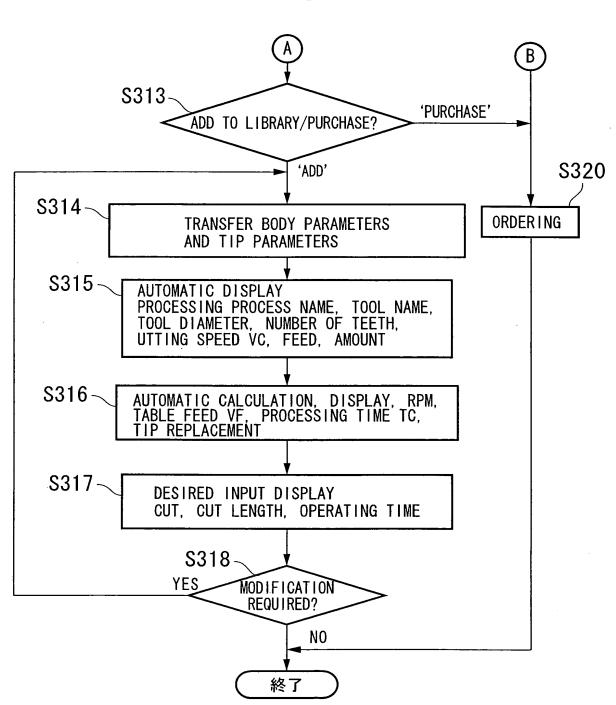


FIG. 5A

04 . 44

| EXTERNAL TURNING | abla |
|----------------------------|------|
| EXTERNAL TURNING BORING | |
| FACE MILLING | |
| END MILLING DRILLING | |

FIG. 5B

SEARCH

FIG. 5C

NOT SPECIFIED

NOT SPECIFIED

FACE MILLING

SHOULDER MILLING

FIG. 5D

NOT SPECIFIED

NOT SPECIFIED

GENERAL CUTTING

FINISHING
HEAVY CUTTING
HIGHFEED
SPECIAL (DIFFICULT-TO-CUT MATERIALS)
QING

FIG. 5E

NOT SPECIFIED
MILD STEEL
CARBON STEEL, ALLOY STEEL
HIGH ALLOY STEEL

STAINLESS STEEL

CAST IRON
DUCTILE CAST IRON
ALUMINUM ALLOY STEEL
COPPER, COPPER ALLOYS
NON-FERROUS METAL
HEAT-RESISTANT ALLOY
TITANIUM ALLOY
HARDENED STEEL

NOT SPECIFIED

FIG. 6A

| ASX44 | ASX445/FACE MILLING | 9 | | | | | | | | | | | | | | | |
|----------------|---------------------|---|--------------------|-----|--------|------------------------|--|--------------------|---------|----------|----|---------|----|-------------------|---------|-------------|-----------------|
| TVDE | ORDER | | NUMBER OF STOCK | | NUMBER | EFFECTIVE NO DIAMETE D | MAXIMUM INNER CUTTING HEIGHT DIAMETER HEIGHT | INNER C EDGE DI | UTT ING | HE I GHT | | MOUNT | | KEY | KEY WAY | CUTTER | MAXIMUM |
| ווע | NUMBER | | Z | N R | ТЕЁТН | ۵ | 10 | 10 | D1 D2 | 王 | ъ | d h1 d1 | ٩. | * | 4 | WEIGHT (Kg) | DEPTH OF CUT |
| COARSE | ASX445- | 1 | 1 | • | 3 | 50 | 63 | I | ı | 40 | 22 | 20 | = | 22 20 11 10 4 6.3 | 6.3 | 0.5 | 9 |
| Z H | ACVAAE | | | | | | | | | | ; | 3 | : | | | ; | • |
| PITCH PITCH | 050A04R | ı | ı | • | 4 | 20 | 63 | ı | 1 | 40 | 22 | 20 | = | 22 20 11 10.4 6.3 | 6.3 | 0.4 | 9 |
| COARSE | L.' | ' | | | - | 63 | 75 0 | | | ç | 5 | 5 | = | 5 | 6 3 | 7 | 9 |
| PITCH | | | | • | r | 3 | | | i | 5 | 77 | 2 | _ | 0.0 4.01 11 07 77 | ၁ ၁ | - - - | 0 |

FIG. 6B

| BRP / | BRP /FACE MILLING | ۲. | | | | | | | | | | | | | | | |
|--------------------|-------------------|------------|----------------|---|--------|-------|--------------------------------------|--------------------|-------------------|---|----|---------|---|------|-----------------------------|----------------|-----------------|
| TVDE | ORDER | <u>~</u> ₽ | UMBER STOCK | * | NUMBER | 1 1 1 | FFECTIVE MAXIMUM DIAMETE DIAMETER | INNER C EDGE DI | UTT ING AMETER | MAXIMUM INNER CUTTING HEIGHT IAMETER HEIGHT | | MOUNT | | KEY | KEY WAY | CUTTER | MAXIMUM |
| - | NUMBER | | Z | ~ | | O | 10 | 10 | 01 02 | I | ъ | d h1 d1 | ㅁ | * | + | WEIGHT (kg) | DEPTH OF CIT |
| CUTTING FDGF R6 | BRP6P- | ı | ı | • | က | 27.8 | 40 | | ı | 40 16 18 | 16 | 18 | | 8 4 | - 8.4 5.6 | | HINF ATH |
| CUTTING | 1 | | | | - | 1 | 8 | | | | | | | | | | |
| EDGE R8 | | 1 | ı | • | 4 | 40. / | | | 1 | 20 | 22 | 20 | Ξ | 10.4 | 22 20 11 10. 4 6. 3 | 0.7 | MAY 5TH |

| 9 | |
|----------|---|
| | • |
| C | |
| \vdash | 4 |
| I | 4 |

| 0BF40 | QBF407/QING SYSTEM | ~ | | | | | | | | | | | | | | | |
|--------|--------------------|----|--------------------|-----|--------|----------------------|---|--------------------|-------------------|--------|-----------|-------|----|-------------------|---------|----------------|-----------------|
| TVDE | ORDER | ~닝 | NUMBER OF STOCK | 1 1 | NUMBER | EFFECTIVE DIAMETE | EFFECTIVE MAXIMUM INNER CUTTING DIAMETE DIAMETE DIAMETER EDGE DIAMETER HEIGHT | INNER C EDGE DI | UTT ING AMETER | HEIGHT | | MOUNT | | KEY | KEY WAY | CUTTER | MAXIMUM |
| ב ב | NUMBER | | Z | N | TEETH | O | D1 | D1 | 02 | Н | d h1 d1 w | ħ | d- | * | + | WEIGHT (kg) | DEPTH OF CUT |
| ı | 0BF407R 03040 | 1 | | • | 4 | 80 | 82.8 | I | 1 | 20 | 25. 4 | 26 | ı | 25.4 26 - 8.8 | 7 | 1.2 | 1 |
| ŧ | 08F407R 04060 | 1 | - | • | 9 | 100 | 102.8 | ı | ı | 63 | 31.75 | 29 | ı | 63 31.75 29 - 8.8 | 7 | 2 | l I |
| I | 08F407R 05080 | 1 | - | • | 8 | 125 | 125 127.7 | ŀ | l I | 63 | 38.1 | 29 | ı | 38.1 29 - 12.8 7 | 7 | 2.9 | I |

2 ty " " " "

OBLON, SPIVAK, et al Docket No: 247925US2 Inventor: Masato YAMADA, et al. Serial No: 10/760,459 Reply to NFMP dated: April 28, 2004 Replacement Sheet

FIG. 6D

| ASX44 | ASX445/FACE MILLING | 9 | | | | | | | | | | | | | | | |
|-----------------|---------------------|----|--------------------|----|--------|----------------------|--------------------------------------|--------------------|---------|--------|---------|-------|----|---------------------|-----|-------------|-----------------|
| TVDE | ORDER | 공능 | NUMBER OF STOCK | ~× | NUMBER | FFECT IVE DIAMETE | FECTIVE MAXIMUM INNER CUTTING HEIGHT | INNER C EDGE DI | UTT ING | HEIGHT | | MOUNT | | KEY WAY | WAY | CUTTER | MAXIMUM |
| 11. | NUMBER | | Z | ~ | TEETH | D | Q | D1 | D2 | = | d h1 d1 | 듣 | ᡖ | * | ىد | WEIGHT (kg) | DEPTH OF CUT |
| COARSE PITCH | SE445R/ L0304C |) | ı | • | 4 | 80 | 102. 2 | ı | 1 | 50 | 25. 4 | 26 | 13 | 50 25.4 26 13 9.5 6 | 9 | 1.6 | 5.5 |
| FINE PITCH | SE445R/ L0306C | ı | ı | • | 9 | 88 | 102. 2 | 1 | 1 | 50 | 25. 4 | 26 | 13 | 50 25.4 26 13 9.5 6 | 9 | 1.6 | 5.5 |

Replacement Sheet

SCREW-ON TYPE HIGH RIGIDITY DUE TO EMPLOYMENT OF A CARBIDE SHIM TYPE 20° POSITIVE INSERT
■ A WIDE RANGE OF CHIP BREAKERS PRECISE BUT INEXPENSIVE MOLDED GENERAL CUTTING E NG FACE MILI ASX445

| ſ | | | \neg | |
|-------------------------|---|---------|-----------------------------------|----------|
| ASE | DIMENSIONAI DRAWING | | F1G. 2 | |
| NSERT SELECT PURCHASE | MAX. DEPTH DIMENSIONAL OF CUT DRAWING | | 9 | |
| INSERT SEL | CUTTER WEIGHT | (NS) | 0.5 | |
| | WAY | t | 6.3 | |
| | KEY WAY | Ж | 10 | |
| | OUNT | d h1 d1 | 40 22 20 11 10 6.3 0.5 | |
| | W | р | 22 | |
| | HE I GHT | Ŧ | 40 | |
| | NER Ting Jge Meter | 01 05 | 1 | |
| | CUT | 10 | 1 | |
| | MAX. Diameter | D1 | 63 | ا ا ر |
| | MBER EFFECTIVE MAX. CUTTING HEIGHT MOUNT OF DIAMETER DIAMETER | Q | 20 | |
| | NUMBER OF | H H | က | |
| | # X | IR | • | |
| | NUMBER OF STOCK | Z | 1 | |
| j) | | | _ | |
| | ORDER NUMBER | | ASX445-050A03R | |
| | ORDER | | ASX44 | |
| | | | 동 | |
| | TYPE | | COARSE PITCH | |

| | WRENCH (SHIM) | MKY 35R |
|---|-----------------|------------|
| B | WRENCH (INSERT) | TIP15T |
| | (3) CLAMP SCREW | TPS35 |
| | (2) SHIM SCREW | WCS503507H |
| | (1) SHIM | STASX445N |

A 37 B R (C)

| S | (mm) | CORNER RADIUS | r | 1.5 | - | 1.5 | | 1.5 | ı | |
|--------------------|----------------|---------------------------------------|---|-----------------|-----|-----------------|--|---------------------------------------|-----------------|---------|
| Noil | | WIPER EDGE | f | 1.9 | | 1.9 | | 1.9 | 2.2 | |
| S S | DIMENSIONS | THICKNESS | S | 3.97 | | 3.97 | | 3.97 | 3.97 | |
| O DN | <u> </u> | CIKCLE INSCRIBED | ٥ | 13. 4 | | 13.4 | | 13. 4 | 13. 4 | |
| CUTTING CONDITIONS | | GEOMETRY | | | D P | | , SZ P P P P P P P P P P P P P P P P P P | | | d d 45° |
| FIG. 8 | CERMET CARBIDE | 01:TH | | • | | • | | | • | |
| | COATED | TOLERANCE F7030 F5010 AP157F | | • | | • | | • • • • • • • • • • • • • • • • • • • | 9 | |
| CHIP BREAKER | | ORDER NUMBER | | SEET13T3AGEN-JL | (4) | SEMT13T3AGSN-JM | | SEMT13T3AGSN-JH | SEGT13T3AGFR-JP | |
| S | | SHAPE | | | | | | | | |

A die b a K

FIG. 6

A to Ma

| | | | | GILLO ONITTIIO |
|---|---------------------------------|-----------------------|---------|--------------------------|
| - | WORKPIECE | HARDNESS | GRADE | CULLING SPEED (m/min) |
| | MILD STEEL | <180HB | F7030 | 200[180~250] |
| | (EG XXXXX) | UNOI E | NX4545 | 180[130~230] |
| | TITE MODIFIES | 180~280HR | F7030 | 160[120~200] |
| | CARBON SIEEL, | 100 2001 | NX4545 | 150[120~180] |
| | (EG XXXXX) | 280~350HB | F7030 | 120[100~150] |
| | | 200 - 00011D | NX4545 | $100[80 \sim 120]$ |
| | HARDENED STEEL | ≥40HRC | AP15TF | 80[80~100] |
| | STAINLESS STEEL | diloto/ | F7030 | 180[130~250] |
| _ | (EG XXXXX) | ≥Z / UHB | NX4545 | 150[120~180] |
| | NICKEL BASE ALLOY (EG XXXXX) | | AP15TF | 40[20~50] |
| | CAST IRON | TENSILE STRENGTH | AP151F | 180[130~250] |
| | (EG XXXXX) | <450N/mm ² | F5010 | 200[150~250] |
| | ALUMINUM ALLOY | _ | HT i 10 | 650[300~1000] |
| 1 | | | | |

| (| _ |
|---|---|
| 7 | |
| | |
| (| F |
| 1 | _ |
| ŕ | I |
| _ | |

and the wife

| ORDER NUMBER | GRADE | INSCRIBED THICKNESS WIP | THICKNESS | WIDTH OF WIPER EDGE | CORNER RAD I US | | SUTTING FEED PER SPEED TOOTH | PRICE | ADD TOOL DATA | |
|-----------------|-------|-------------------------|-----------|---------------------------|--------------------|-----|------------------------------|------------|------------------|--|
| SEET13T3AGEN-JL | F7030 | 13.4 | 3.97 | 1.9 | 1.5 | 160 | 0.15 | 1, 090 YEN | PURCHASE | |

FIG. 11

A. 4) - F. 2. - A. 4.

| TOOL PROCESS TOOL NAME DRAWING TEETH SPEED TIME FEED CUT(ap) LENGTH OF CUTTING MACHINING OPERATING INSERT TIME FEED CUT(ap) LENGTH TIME REPLACEMENT PRICE TOTOL NAME TOOL NAME TOOL NAME TOOL NAME TO TO | | | | |
|--|-------------------------|---------|----------------|--|
| MACHINING PROCESS TOOL NAME DRAWING TOOL NAME DRAWING TOOL NAME DRAWING TOOL NAME TEETH SPEED OF THE SPEED TOOL NAME | PRICE | | 41, 160 YEN | |
| MACHINING PROCESS TOOL NAME DRAWING TEETH SPEED REVOLUTION FEED GUT (ap) LENGTH TIME TIME TIME TIME TIME TIME TIME TIME | INSERT REPLACEMENT | | 0 | |
| MACHINING PROCESS TOOL NAME DRAWING PROCESS NAME TER TEETH SPEED REVOLUTION TABLE IMM IN | PERATI TIME min | | က | |
| MACHINING PROCESS TOOL NAME DRAWING PROCESS NAME TER TEETH SPEED REVOLUTION TABLE IMM IN | MACHINING | min | 62 | |
| MACHINING PROCESS TOOL NAME DRAWING PROCESS NAME TER TEETH SPEED REVOLUTION TABLE IMM IN | CUTTING | | 200 | |
| MACHINING PROCESS TOOL NAME DRAWING PROCESS NAME TOOL NAME TOOL NAME NAME NAME NAME FACE ASX445-063A04R 63 4 160 0.15 809 | DEPTH OF CUT (ap) | | - | |
| MACHINING PROCESS NAME NAME FACE ASX445-063A04R MILLING SEETI3T3AGEN-JLF7030 MILLING MACHINING TOOL NAME DRAWING DIAMETER TEETH SPEED M/min m/tooth min-1 63 4 160 0.15 809 | TABLE FEED mm/min | | 485 | |
| MACHINING PROCESS TOOL NAME NAME FACE ASX445-063A04R MILLING SEET13T3AGEN-JLF7030 FACE ASX45-063A04R FACE ASX5-063A04R FACE ASX5 | REVOLUTION min-1 | | 608 | |
| MACHINING PROCESS TOOL NAME NAME FACE ASX445-063A04R MILLING SEFT13T3AGEN-JLF7030 FACE ASX445-063A04R FACE ASX45-063A04R FACE ASX45-063A | | m/tooth | 0. 15 | |
| MACHINING TOOL NAME DRAWING DIAMETER TEETH NAME IN MILLING SEETI3T3AGEN-JLF7030 | CUTT ING SPEED | m/min | 160 | |
| MACHINING PROCESS TOOL NAME DRAWING DIAMETER NAME FACE ASX445-063A04R MILLING SEETI3T3AGEN-JLF7030 SETIATAGEN SEETI3T3AGEN-JLF7030 SEETIATAGEN SEETIAT | NUMBEI OF TEETH | | 4 | |
| MACHINING TOOL NAME IN NAME NAME NAME ASX445-063A04R MILLING SEETI3T3AGEN-JLF7030 | TOOL Diameter | mm | 63 | |
| MACHINING PROCESS NAME FACE A | DRAWING | | | |
| ≥ [— | TOOL NAME | | A 0 | |
| T00L N0. | | | FACE | |
| | T00L N0. | | - | |

 $A^{-\frac{1}{2}} = F_{2}^{2} = -\frac{1}{23} \frac{1}{4}$

TOOLING SHEET

| PREPARED BY | 00K1 | |
|---------------------|------------|--|
| DATE OF PREPARATION | 2001.06.06 | |
| DRAWING NUMBER | YC12345C | |
| WORK | TEST WORK | |

| _ | | |
|---|-----------|-----------|
| | 11 HOURS | 9 MINUTES |
| L | _ | <u> </u> |
| | MACHINING | TIME |

| | | | | | | . <u> </u> |
|---|----------|---|---------------------------------------|--|-------------------------------|--------------------------|
| PRICE. | | 41, 160 YEN | 38, 000 YEN | 42, 500 YEN | 31, 500 YEN | 30, 150 YEN |
| INSERT REPLACEMENT | | 0 | 0 | _ | 0 | 2 |
| REVOLUTION FEED OF CUT CUTTING MACHINING OPERATING INSERT (ap) LENGTH TIME TIME REPLACEME | min | က | က | 3 | က | က |
| MACHINING | mim | 62 | 9 | 222 | 59 | 315 |
| CUTTING | шш | 200 | 120 | 2, 000 | 200 | 0. 4 2, 000 |
| 0ЕРТН ОF СОТ (ap) | E E | - | 9 | 0.5 | _ | 0.4 |
| TABLE FEED | mm/min | 485 | 1, 147 | 541 | 510 | 382 |
| REVOLUTION | min-1 | 808 | 1, 911 | 2, 707 | 1, 300 | 1,911 |
| FEED | mm/tooth | 0.15 | 0.15 | 0.10 | 0. 10 | 0.10 |
| OUTT ING SPEED | m/min | 160 | 150 | 170 | 82 | 09 |
| NUMBER OF TEETH | | 4 | 4 | 2 | 4 | 2 |
| TOOL Diameter | | 63 | 25 | 20 | 20 | 10 |
| DRAWING | | | | | | |
| TOOL NAME | | FACE MILLING ASX445-163A04R SEET13T3AGEN-JLF7030 | BAP300R254S25 APMT1135PDER-M2F7030 | SRN2200SNM SRG20CAP15TF SRG20EAP15TF | SZE4200SG | RMH100S12 RMT10AP15TF |
| MACHINING PROCESS NAME | | FACE MILLING | 3 SLOT MILLING (ROUGHING) | (ROUGHING) | 7 SLOT MILLING (FINISHING) | 5 COPYING (FINISHING) |
| 100 100 100 | | _ | က | 4 | 7 | വ |